

GCSE Science Chemistry strand – overview

YEAR 10	Content	Skills
Autumn Half Term 1	<p>Organic chemistry – students begin to learn about the chemistry of carbon.</p> <p>Spec points: 5.7.1.1, 5.7.1.2, 5.7.1.3, 5.7.1.4</p>	<p>Students make models of molecules using molecular modelling kits as well as investigating the properties of different hydrocarbons. They draw line graphs showing the trends in properties of hydrocarbons such as boiling points. Students also have the opportunity to conduct the microscale cracking of hydrocarbons.</p>
Autumn Term 2	<p>Energy change in reactions – students begin to learn about the energy change in reactions.</p> <p>Spec points: 5.5.1.1, 5.5.1.2, 5.5.1.3</p>	<p>Students learn about the energy change in chemical reactions. They quantitatively calculate the energy change for reactions.</p> <p>Required prac 10:</p> <p>AT 1 – Use of appropriate apparatus to make and record a range of measurements accurately, including mass, temperature, and volume of liquids.</p> <p>AT 3 - Use of appropriate apparatus and techniques for conducting and monitoring chemical reactions.</p> <p>AT 5 - Making and recording of appropriate observations during chemical reactions including changes in temperature.</p> <p>AT 6 - Safe use and careful handling of gases, liquids and solids, including careful mixing of reagents under controlled conditions, using appropriate apparatus to explore chemical changes.</p>
Spring Term 1	<p>Ions and electrolysis – students recap ions, learn about ionic bonding and use this to learn about electrolysis</p> <p>Spec points: 5.2.1.2, 5.2.1.3, 5.2.2.3, 5.4.3.1, 5.4.3.2, 5.4.3.3, 5.4.3.4, 5.4.3.5</p>	<p>Students begin to learn about ions and apply this to ionic bonding. Students then learn about electrolysis and use their knowledge of ions which underpins this topic. They develop their investigative skills via electrolysis practicals. Microscale alternatives are also used where appropriate and these help to develop other motor skills.</p> <p>Required prac 9:</p> <p>AT 3 - Use of appropriate apparatus and techniques for conducting and monitoring chemical reactions.</p> <p>AT 7 – Use of appropriate apparatus and techniques to draw, set up and use electrochemical cells for separation and production of elements and compounds.</p> <p>AT 8 - Use of appropriate qualitative reagents and techniques to analyse and identify unknown samples or products including gas tests for hydrogen, oxygen and chlorine.</p>
Spring Term 2	<p>Rates and reversible reactions – students</p>	<p>Students calculate the rate of reactions quantitatively instead of just qualitatively. They must use decimal forms, use ratios,</p>

	<p>learn about why reactions have different rates as well as reversible reactions and dynamic equilibrium.</p> <p>Spec points: 5.6.1.1, 5.6.1.2, 5.6.1.3, 5.6.1.4, 5.6.2.1, 5.6.2.2, 5.6.2.3, 5.6.2.4, 5.6.2.7</p>	<p>fractions and percentages, determine the slope and intercept of a linear graph as well as draw and use the slope of a tangent to a curve as a measure of rate of change.</p> <p>Required prac 11: AT 1 – Use of appropriate apparatus to make and record a range of measurements accurately, including mass, temperature and volume of liquids. AT 3 - Use of appropriate apparatus and techniques for conducting and monitoring chemical reactions. AT 5 - Making and recording of appropriate observations during chemical reactions including changes in temperature. AT 6 - Safe use and careful handling of gases, liquids and solids, including careful mixing of reagents under controlled conditions, using appropriate apparatus to explore chemical changes.</p>
Summer Term 1	<p>Chemical analysis – students learn about how to analyse chemicals.</p> <p>Spec points: 5.8.1.1, 5.8.1.2, 5.8.1.3, 5.8.2.1, 5.8.2.2, 5.8.2.3, 5.8.2.4</p>	<p>Students begin to develop their understanding of ratios, fractions and percentages. They calculate R_f values (KS3) but develop this further by interpreting chromatograms and also providing answers to an appropriate number of significant figures.</p> <p>Required prac 12: AT 1 - Use of appropriate apparatus to make and record a range of measurements accurately. AT 4 – Safe use of a range of equipments to purify and/or separate chemical mixtures including chromatography. WS 2.4, WS 2.6</p>
Summer Term 2	<p>Chemistry of the atmosphere – students learn about the atmosphere and the history of the atmosphere.</p> <p>Spec points: 5.9.1.1, 5.9.1.2, 5.9.1.3, 5.9.1.4</p>	<p>Here students begin to develop their understanding of the atmosphere. Students use this topic to develop their skills using word and symbol equations. Students are also presented with appropriate information and are asked to interpret the evidence as well as evaluate different theories about the Earth's early atmosphere.</p>

YEAR 11	Content	Skills
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Autumn Half Term 1	<p>Chemistry of the atmosphere – students continue to learn about the chemistry of the atmosphere.</p> <p>Spec points: 5.9.2.1, 5.9.2.2, 5.9.2.3, 5.9.2.4, 5.9.3.1, 5.9.3.2</p>	Students continue to develop their skills in evaluating different evidence about global climate change. Students also use uncertainties and introduce peer review of results. They discuss scale, risk and environmental implication of global climate change. They use their knowledge of balanced symbol equations to explain the effect of different atmospheric pollutants.
Autumn Term 2	<p>Using resources – students learn about the resources on Earth and the role humans play in ensuring they're sustainable.</p> <p>Spec points: 5.10.1.1, 5.10.1.2, 5.10.1.3, 5.10.1.4, 5.10.2.1, 5.10.2.2</p>	<p>Students will extract and interpret information about the Earth's resources from charts, graphs and tables. They develop their use of orders of magnitude to evaluate the significance of data about the Earths' resources. They carry out an LCA and also research their own carbon footprint and evaluate how to reduce it.</p> <p>Required prac 13: AT 2 - Safe use of appropriate heating devices and techniques including use of a Bunsen burner and a water bath or electric heater. AT 3 - Use of appropriate apparatus and techniques for the measurement of pH in different situations. AT 4 - Safe use of a range of equipment to purify and/or separate chemical mixtures including evaporation, distillation.</p>
Spring Term 1	<p>Quantitative chemistry 2 – students learn about the mole and calculations in chemistry.</p>	Here students have the opportunity to use decimal form and also extend this to standard form. Students also must be able to change the subject of an equation as well as substitute numerical values into algebraic equations using appropriate units for physical quantities – which students often find difficult.
Spring Term 2	<p>Revision and Exam Preparation</p>	